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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,731	05/23/2000	William Dean Bauman	DP-300043	4741

7590

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EXAMINER

COMPTON, ERIC B

ART UNIT PAPER NUMBER

3726

DATE MAILED: 02/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/576,731

Applicant(s)

BAUMAN ET AL.

Examiner

Eric B. Compton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 17 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed December 17, 2002, fails to comply with 37 CFR 1.97(c) because it lacks a statement as specified in 37 CFR 1.97(e). It has been placed in the application file, but the information referred to therein has not been considered.
2. Additionally, the information disclosure statement fails to comply with 37 CFR 1.97(c) because it lacks the fee set forth in 37 CFR 1.17(p).

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant states on pages 8-9, lines 22-2 of the specification, "In step 2-C, the surface of the bore is hard turned to a specific inner diameter, using, for example a

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diamond honing machine such as an Accu-Cut machine, available from Accu-Cut Co. Norridge, Illinois.”

However, according to information on the Accu-Cut website, regarding honing, “the tool makes a light cut with a fine grained abrasive (240-600 grain size) ...”

Furthermore, it is noted that “The abrasive grains are bonded to form stones which are typically both rotated and reciprocated in contact the work surface.” “Each abrasive grain in contact with the workpiece removes a small chip and the grains are continuously broken down by the process to expose new, sharp grains.” See also the information on grinding and honing from the Mechanical Engineers’ Handbook, pages 892-895.

Thus, it is believed the hard turning process detailed by Applicant in the specification for step 2-C is merely a grinding step and not a hard turning (e.g. a lathe operation) as claimed for step 2-C. Note: Applicant’s disclosure is enabling for a hard turning process for step 2-E (e.g., a lathe) (page 9, line 10-14).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of US Patent 4,077,812 to Tani.

AAPA, as found on pages 1-6 of the specification, discloses a prior art process for forming a metal roller bearing comprising forming a steel blank by either warm forging, hot forging, cold forging, and machining. As shown in Figure 1, various grinding processes form the specific bearing surfaces of the blank.

However, AAPA do not disclose hard turning to form the inner and outer bearing surfaces.

Tani discloses a method (see col 4, lines 3-6) for forming machine parts, including shaft bearing steels (col. 1, lines 56-57) comprising: providing a steel machine part, providing a heat treatment (e.g., quick cooling after uniform heating "quenching"), auscutting (tuning, see col 4, lines 40-42), tempering, and further turning.

Regarding claim 1, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have formed the cylindrical (metal roller) bearing of AAPA by hard turning the inner and outer bearing surfaces without grinding, in light of the teachings of Tani, in order to produce a bearing having material saving and reduced labor requirements (col 2, lines 23-24).

Regarding claim 2, it is inherent in process of Tanbi/AAPA that radial crown of a bearing is is formed.

Regarding claim 3, AAPA discloses providing a steel blank formed by either forging or machining.

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Regarding claim 4, AAPA notes that heat treating of the blank prior to finishing is known (see page 8, lines 11-15). Tani also notes heat treatment of the workpiece.

Regarding claims 5-6, AAPA disclosed that it is known to forge the blank. Therefore, a flash piece is formed that must be subsequently removed. The prior art teaches grinding finish the inner surface of the bore. This operation inherently will remove the flash. Tani teaches turning the inner surface of the bore rather than grinding.

Regarding claim 7, Official Notice is taken that diamond honing machinery is known in the art.

Regarding claim 8, AAPA notes that forming an incised cross-hatched pattern on the inner surface of the bore is known (see page 2, lines 18-20).

Regarding claim 9, Official Notice is taken that the use of computer numerically controlled (CNC) lathes is well known in the art of manufacturing.

Regarding claims 10-11, the specification notes that, "The steps of hard turning of the surface of the bore and the lateral surface of the blank can be carried out in either order ..." (page 9, line 15-16). Therefore, it would have been obvious to a skilled artisan to perform these steps in either order since it has no effect on the implementation of the invention.

Regarding claim 12, Official Notice is also taken that cubic boron nitride or ceramic cutting coated tools are well known in the machining arts to extend the life of the tool.

Regarding claim 13, Tani suggests that the hard turning of the lateral (outer) surface can be carried out in a single operation.

Regarding claim 14, it is inherent that the end face surfaces of the blank correspond to the end face surfaces of a cylindrical bearing roller.

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of US Patent 4,593,444 to Kavthekar and US Patent 4,820,240 to Girguis.

AAPA, as found on pages 1-6 of the specification, discloses a prior art process for forming a metal roller bearing comprising forming a steel blank by either warm forging, hot forging, cold forging, and machining. As shown in Figure 1, various grinding processes form the specific bearing surfaces of the blank.

However, AAPA do not disclose hard turning to form the inner and outer bearing surfaces.

Kavthekar discloses a method of forming a bearing comprising:

obtaining a metal blank (108) having end face surfaces, a lateral surface defining an outer diameter, and a centered circular bore, said bore having an inner surface defining an inner diameter;

hard turning the inner surface of the bore having a specified inner diameter, thereby forming an inner bearing surface (see Figures 17 & 18, col 8, lines 38-69); and

hard turning the lateral surface of the blank to a specified outer diameter, thereby forming an outer bearing surface concentric with the inner bearing surface (see Figures 15 & 16, col 8, lines 23-37).

Note: the fact that Kavthekar discloses additional grinding after the hard turning does not detract from initial teachings with respect to the hard turning to produce the inner and outer bearing surfaces to specific diameter. Also note that Kavthekar, like Applicant, does not require the step of grinding the blank end faces of the blank as found in AAPA.

It would have been obvious to one of ordinary skill in the art, at the time of invention, to have formed the cylindrical (metal roller) bearing of AAPA by hard turning the inner and outer bearing surfaces, in light of the teachings of Kavthekar, in order to execute machining performed on common machines without removing the workpieces held in common workheads (col 2-3, lines 64-10).

However, AAPA/Kavthekar do not disclose only turning to form the inner and outer bearing surfaces.

Girguis disclose a method for forming a bearing. "Since the guide surfaces (3' and 5') touch the bearing surfaces (2' and 4', respectively) at the end of their width, the adjoining surface of revolution (21-41) are preferably to be produced coaxially with the adjacent bearing surfaces, in one chucking operation, for example by means of grinding. It is also possible, of course, to produce only the parts of the bearing surfaces directly in contact with the guide surface with the necessary accuracy, for example by means of grinding, otherwise lower accuracy, for example turning, would be sufficient" (col 8, lines 21-31).

One of ordinary skill in the art would find it obvious to provide finishing grinding necessary for a particular application, in order to provide the proper surfacing. In



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Kavthekar, the inventors required an additional degree of surface finishing and therefore grinding for their particular finishing.

In Girguis there is a teaching that the machining process, itself, that is sufficient enough for the particular finishing, thus no grinding is required. Therefore, it would have been obvious to one having ordinary skill in the art, at the time the invention was made to have selected the degree of finishing required, with or without additional grinding, in light of these teachings, in order to finish a bearing with a predetermined finish sufficient for a particular application.

Regarding claim 1, it would have been obvious to one of ordinary skill in the art, at the time of invention, to have formed the cylindrical (metal roller) bearing of AAPA/Kavthekar by hard turning the inner and outer bearing surfaces without grinding, in light of the teachings of Girguis, in order to produce a bearing having a sufficient surface finish without additional grinding.

Regarding claim 2, Figure 16 of Kavthekar shows the radial crown being formed.

Regarding claim 3, AAPA discloses providing a steel blank formed by either forging or machining.

Regarding claim 4, AAPA notes that heat treating of the blank prior to finishing is known (see page 8, lines 11-15). Kavthekar also notes heat treatment of the workpiece (col 9, lines 1-7).

Regarding claims 5-6, AAPA disclosed that it is known to forge the blank. Therefore, a flash piece is formed that must be subsequently removed. The prior art teaches grinding finish the inner surface of the bore. This operation inherently will

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remove the flash. Kavthekar teaches turning the inner surface of the bore rather than grinding. Therefore, turning the inner surface of the bore as taught by Kavthekar will remove the flash just as the prior art grinding operation did.

Regarding claim 7, Official Notice is taken that diamond honing machinery is known in the art.

Regarding claim 8, AAPA notes that forming an incised cross-hatched pattern on the inner surface of the bore is known (see page 2, lines 18-20).

Regarding claim 9, Official Notice is taken that the use of computer numerically controlled (CNC) lathes is well known in the art of manufacturing.

Regarding claims 10-11, the specification notes that, "The steps of hard turning of the surface of the bore and the lateral surface of the blank can be carried out in either order ..." (page 9, line 15-16). Therefore, it would have been obvious to a skilled artisan to perform these steps in either order since it has no effect on the implementation of the invention.

Regarding claim 12, Official Notice is also taken that cubic boron nitride or ceramic cutting coated tools are well known in the machining arts to extend the life of the tool.

Regarding claim 13, as shown in Figure 13 of Kavthekar, the hard turning of the lateral surface can be carried out in a single operation.

Regarding claim 14, it is inherent from Kavthekar that the end face surfaces of the blank correspond to the end face surfaces of a cylindrical bearing roller.

***Response to Arguments***

6. Applicant's arguments filed December 17, 2002, have been considered but are not found persuasive.

Applicant's arguments are have essentially been addressed before. One of ordinary skill in the art would find it obvious to provide finishing grinding necessary for a particular application, in order to provide the proper surfacing. In Kavthekar, the inventors required an additional degree of surface finishing and therefore grinding for their particular finishing. In Girguis, there is a teaching that the machining process, itself, is sufficient enough for the particular finishing, thus no grinding is required. Therefore, it would have been obvious to one having ordinary skill in the art, at the time the invention was made to have selected the degree of finishing required, with or without additional grinding, in light of these teachings, in order to finish a ball cage with a predetermined finish. Likewise in Tani, "The worked surface roughness obtained by the described operation is 10-30  $\mu$ , so that when it is desired to have a better worked surface, finishing by grinding becomes necessary." (col 5, lines 11-14). The argument that the prior art disclose a ball joint rather than a bearing roller is not found persuasive either. One of ordinary skill in the art realized that a ball joint is a bearing itself, and that the forming processes are nearly identical.

Applicant states on pages 8-9, lines 22-2 of the specification, "In step 2-C, the surface of the bore is hard turned to a specific inner diameter, using, for example a diamond honing machine such as an Accu-Cut machine, available form Accu-Cut Co. Norridge, Illinois." A multiple spindle machine tool is described. However, accordingly to

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information on the Accu-Cut website, regarding honing ,” the tool makes a light cut with a fine grained abrasive (240-600 grain size) ...” Furthermore, it is noted that “The abrasive grains are bonded to form stones which are typically both rotated and reciprocated in contact the work surface.” “Each abrasive grain in contact with the workpiece removes a small chip and the grains are continuously broken down by the process to expose new, sharp grains.” Thus, it is believed the hard turning process in step 2-C of Applicant is merely a grinding step or may contain a grinding step.

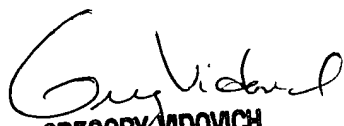
### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Compton whose telephone number is (703) 305-0240. The examiner can normally be reached on M-F, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory M. Vidovich can be reached on (703) 308-1513. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

  
ebc  
February 4, 2003

  
GREGORY VIDOVICH  
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